

DOCKET: CU 2639

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Masahiro Goto)
SERIAL NO: 10/562,516) Group Art Unit:
FILED: December 28, 2005) Examiner:
TITLE: View Angle Control Sheet

AMENDED CLAIMS

1. (currently amended) A view angle control sheet ~~characterized in that~~ comprising lens portions having trapezoidal shapes in cross section ~~[[are]]~~ arranged at predetermined intervals, a wedge-shaped portion between the lens portions adjacent to each other is filled with the same material as the lens portion or with a material different from the lens portion, the wedge-shaped portion has a bottom surface on a screen image side while having a leading edge on an observer side, and the following relationship is held at least between a refractive index N2 of a material constituting a slope portion of the wedge-shaped portion and a refractive index N1 of a material constituting the lens portion:

$$N2 \leq N1.$$

2. (currently amended) A view angle control sheet according to claim 1, ~~characterized in that~~ wherein an angle θ (degree) formed by the slope portion and a normal line of a light beam outgoing plane exists in the following range:

$$3 \leq \theta \leq 20.$$

3. (currently amended) A view angle control sheet according to claim 2,

~~characterized in that~~ wherein the following relationship is held further between the refractive indexes N1 and N2:

$$0.8N1 \leq N2 \leq 0.98N1.$$

4. (currently amended) A view angle control sheet according to claim 1 ~~or 2~~, ~~characterized in that~~ wherein the following relationship is held still further between the refractive indexes N1 and N2:

$$N1 - 0.01 \leq N2.$$

5. (currently amended) A view angle control sheet according to ~~any one of claims 1 to 4~~, ~~characterized in that~~, claim 1, wherein when a ratio of the refractive indexes N1 and N2 is $N2/N1 = R$, the following relationship is held further in the angle θ (degree) formed by the slope portion of the wedge-shaped portion and the normal line of the light beam outgoing plane:

$$-0.01 < R \cdot \cos\theta < 0.002.$$

6. (currently amended) A view angle control sheet according to ~~any one of claims 1 to 5~~, ~~characterized in that~~ claim 1, wherein a cross-sectional shape of the wedge-shaped portion is a substantial isosceles triangle.

7. (currently amended) A view angle control sheet according to ~~any one of claims 1 to 5~~, ~~characterized in that~~ claim 1, wherein one of angles formed by two slopes of the wedge-shaped portion and the normal line of the light beam outgoing plane is larger than the other.

8. (currently amended) A view angle control sheet according to ~~any one of~~ ~~claims 1 to 7, characterized in that~~ claim 1, wherein the slope portion has a curved cross-sectional shape and/or a polygonal-line cross-sectional shape such that the screen image side differs from the observer side in an angle formed by the slope portion and an observer side surface.
9. (currently amended) A view angle control sheet according to ~~any one of~~ ~~claims 1 to 8, characterized in that~~ claim 1, wherein the wedge-shaped portion has a light beam absorption effect.
10. (currently amended) A view angle control sheet according to ~~any one of~~ ~~claims 1 to 9, characterized in that~~ claim 1, wherein light beam absorption particles are added to the wedge-shaped portion.
11. (currently amended) A view angle control sheet according to claim 10, ~~characterized in that~~ wherein an average particle size of the light beam absorption particles is at least 1 μm and the average particle size is not more than two-thirds of a width of the bottom surface.
12. (currently amended) A view angle control sheet according to claim 10 ~~or 11,~~ ~~characterized in that~~ , wherein an addition amount of the light beam absorption particle ranges from 10 to 50 % by volume.
13. (currently amended) A view angle control sheet according to ~~any one of~~ ~~claims 1 to 12, characterized in that~~ claim 1, wherein a function of any one of AR,

AS, AG, and a touch sensor or a plurality of functions thereof are imparted to at least one surface side.

14. (currently amended) A display device ~~characterized in that~~ wherein a view angle control sheet according to ~~any one of claims 1 to 13~~ claim 1 is bonded.

15. (currently amended) A display device ~~characterized in that~~ wherein a view angle control sheet according to ~~any one of claims 1 to 13~~ claim 1 is arranged in a crosswise stripe.

16. (currently amended) A display device ~~characterized in that~~ wherein one view angle control sheet according to ~~any one of claims 1 to 13~~ claim 1 is laminated on the observer side of a screen image source or two view angle control sheets according to ~~any one of claims 1 to 13~~ claim 1 are laminated the observer side of the screen image source while being substantially orthogonal to each other.

17. (currently amended) A display device according to claim 16, ~~characterized in that~~ wherein the width of the bottom surface is not more than 1/1.5 of a size of one pixel.